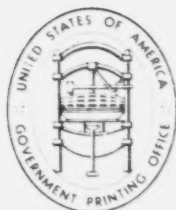


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ORIGINAL
UNITED STATES GOVERNMENT PRINTING OFFICE

Quality Assurance Through Attributes Program

Contract Terms



NOTICE:

Specifications containing Quality Attributes requirements will incorporate this document by reference. It should, therefore, be kept current and readily available for your use in bidding and contract compliance.

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TABLE OF CONTENTS

	Page
Definitions.....	1
Determination of Product Quality.....	2
Determining Acceptability.....	2
Categories of Attributes.....	2
Tolerance Table for Printing Attributes.....	3
Tolerance Table for Paper Attribute.....	3
Government Furnished Material.....	4
Printing Attributes.....	5
P-1. Hickies and Spots.....	5
P-2. Extraneous Marks.....	6
P-3. Moire.....	8
P-4. Register.....	8
P-5. Text and Illustration Image Position.....	10
P-6. Newton's Rings.....	13
P-7. Type Quality and Uniformity.....	14
P-8. Halftone Match.....	18
P-9. Solid or Screen Tints Color Match.....	21
P-10. Process Color Match.....	22
P-11. Rub-Resistance of Printed Image.....	23
Finishing Attributes.....	25
F-1. Trim Size.....	25
F-2. Misplacement and Misalignment of Cover Image.....	26
F-3. Cover Position.....	28
F-4. Folding Position and Skewness.....	29
F-5. Perfect-Bound Book Durability.....	30
F-6. Loose Cover, Pages, and Binding.....	32
F-7. Excess Glue.....	33
F-8. Damaged Pages.....	34
F-9. Damaged Edges.....	35
F-10. Warpage of Case-Bound Books.....	36
F-11. Damaged Covers.....	37
F-12. Missing Pages.....	38
F-13. Upside Down Cover.....	38
F-14. Upside Down Pages.....	38
F-15. Blank Pages - Other Than Specified.....	38
F-16. Wrong Pagination.....	38
F-17. Loss of Information.....	38
F-18. A Serious Shift in Process Color Match.....	38

	Page
Paper Attribute.....	39
<u>Paper Characteristics</u>	
1. Acidity.....	39
2. Alpha Cellulose.....	39
3. Basis Weight.....	39
4. Bursting Strength.....	39
5. Copper Number.....	39
6. Dirt.....	39
7. Finish.....	39
8. Folding Endurance.....	39
9. Gloss.....	39
10. Oil Penetration.....	39
11. Opacity.....	40
12. Optical Brighteners.....	40
13. Pick Resistance.....	40
14. Porosity.....	40
15. Rosin.....	40
16. Stiffness.....	40
17. Stock.....	40
18. Tensile Strength.....	41
19. Tearing Strength.....	41
20. Thickness.....	41
21. Water Resistance.....	41
22. All Other Measurable Characteristics.....	41
23. Judgment Characteristics.....	41
Guide for Equitable Reductions.....	42
Appendix A - Discount Table for Critical Defects.....	42
Appendix B - Discount Table for Major Defects.....	44

QUALITY ASSURANCE THROUGH ATTRIBUTES PROGRAM
(QATAP)

1. DEFINITIONS

1-1. Quality Attribute - A quality attribute is a property of a printed product which affects its quality. Examples are trim size, image position, type quality, and paper.

1-2. Lot or Batch - A lot or batch is a quantity of copies of a publication from which a sample is drawn. A lot or batch consists of copies which are produced under essentially the same conditions and at essentially the same time.

1-3. Critical Defect - A critical defect is a serious deviation from specifications. Critical defects are designated in the tolerance tables for finishing attributes and the paper attribute.

1-4. Major Defect - A major defect is a deviation from specifications which is less serious than a critical defect. Major defects are designated in the tolerance tables for printing attributes, finishing attributes, and the paper attribute.

1-5. Total Defects - Total defects are the sum of all critical and all major defects (e.g., 3 critical defects + 2 major defects = 5 total defects).

1-6. Acceptable Quality Levels (AQL's) - The AQL's are the maximum number of defects per 100 copies that the Government will accept at the contract price. Unless otherwise specified, the AQL's are 1.0 for critical defects and 6.5 for total defects.

1-7. Product Quality Levels (PQL's) - The PQL's specify the degree of quality required in the final product. QATAP contains five PQL's ranging from Level I (Best) to Level V (Functional). Generally, tolerances for attributes vary with the PQL.

1-8. Inspection Levels - The inspection levels are the means used to determine the relationship between the lot or batch size and the minimum sample size. Inspection Levels will be specified in accordance with page 9 of "Military Standard Sampling Procedures and Tables for Inspection by Attributes" (MIL-STD-105D). Copies of MIL-STD-105D are available without charge from Naval Publications and Forms Center, Tabor Ave., Philadelphia, PA 19120, or to request copies by telephone, call area code 215-697-3321.

1-9. Specified Standards - The specified standards are the criteria on which printing attributes P-7, P-8, P-9, and P-10 are evaluated. For example, process color match (P-10) might be evaluated by comparing a printed illustration with an "OK'd press sheet." In this example, the "OK'd press sheet" would be listed in the specifications as the specified standard for printing attribute P-10.

Standards will be specified for the following attributes:

- P-7 Type Quality and Uniformity
- P-8 Halftone Match
- P-9 Solid or Screen Tints Color Match
- P-10 Process Color Match

1-10. Average Demerit Levels (ADL's) - ADL's are one of the means used to classify defects for printing attributes.

1-11. Standard Viewing Conditions - Standard viewing conditions are those defined in "ANSI PH2.32-1972 American National Standard Viewing Conditions for the Appraisal of Color Quality and Color Uniformity in the Graphic Arts, Part 1, 'Viewing Conditions for the Appraisal of Color Quality in the Graphic Arts'."

2. DETERMINATION OF PRODUCT QUALITY

a. QATAP establishes attributes for quality and it defines tolerances for those attributes for five quality levels of printing. When attributes deviate from the allowable tolerances, the deviations will be classified as either major or critical defects pursuant to the applicable tolerance table.

b. Attributes which are not identified as quality attributes under QATAP (e.g., stitching position) will be evaluated in accordance with the article entitled "Quality" in U.S. Government Printing Office Contract Terms No. 1.

3. DETERMINING ACCEPTABILITY - Because inspection of all copies of a publication is usually impractical, the Government will utilize statistical sampling to determine quality. When the Government determines that both the number of critical defects and the number of total defects in the lot or batch do not exceed their respective AQL's, the lot or batch will be accepted at the contract price. MIL-STD-105D will be used to make this determination.

If the defects exceed either or both AQL's, the Government will have the option of having the lot or batch replaced, having the defects corrected, or accepting the lot or batch with an equitable reduction in the contract price. The discount tables contained in Appendices A & B will be used as a guide by the Contracting Officer to determine reductions. Failure to agree to such reduction of price shall be a dispute concerning a question of fact within the meaning of the article entitled "Disputes" of Contract Terms No. 1. In all cases it is the intent of the Government that the products meet the quality required in the specifications.

4. CATEGORIES OF ATTRIBUTES - Quality attributes are divided into three categories which consist of printing attributes, finishing attributes, and the paper attribute.

4-1. Printing Attributes - For each copy that is inspected, the Government will evaluate each applicable printing attribute by separately inspecting:

- a. outside covers (i.e., the spine and covers 1 & 4)
- b. text (i.e., pages and covers 2 & 3)

ADL's will be determined as follows:

- (i) Outside covers will be inspected and evaluated as one unit. The unit will be assessed demerits (i.e., 4, 20, 100) pursuant to the demerit table for each printing attribute that deviates from specifications. The demerits which are assessed constitute the ADL for outside covers for that printing attribute for that copy.

- (ii) The text will be evaluated by inspecting pages (each page is an individual unit), cover 2, and cover 3 as individual units. Each unit will be assessed demerits (i.e., 4, 20, 100) pursuant to the demerit table for each printing attribute that deviates from specifications. The demerits which are assessed will be summed, and each sum will be divided by the number of individual units that were inspected for that printing attribute. The quotient constitutes the ADL for text for that printing attribute for that copy.
- (iii) In each copy the ADL's for each printing attribute will be classified as follows:

Tolerance Table for Printing Attributes

<u>ADL's</u>	<u>Classification of Defect</u>
4 or less for both outside covers and text	None
More than 4 for either or both outside covers and text	Major

Conspicuous Single Page Defects - When one or more pages have been assessed demerits for a printing attribute but the ADL does not exceed 4, a single major defect will be assessed for that printing attribute if one or more pages is so conspicuously defective that it significantly impairs the quality of the entire copy. Examples include a large hickey at the focal point of an illustration, a single page with extremely light (but legible) type, large ink spots, large oil spots, and large off-color spots in illustrations.

4-2. Finishing Attributes - The Government will evaluate finishing attributes by inspecting individual copies of publications. When each copy is inspected, each applicable finishing attribute that deviates from specifications will be classified as either a critical or major defect in accordance with the tolerance table for that attribute.

4-3. Paper Attribute - The Government will evaluate the paper attribute by inspecting and testing paper characteristics in individual copies of publications. The paper characteristics will be tested in accordance with the current edition of "Government Paper Specification Standards, Part 2 - 'Testing Standards'," which is published by the Joint Committee on Printing. When each copy is inspected, each applicable paper characteristic that deviates from specifications will be assessed demerits in accordance with the demerit table for that characteristic. For each individual copy, the sum of demerits for all applicable paper characteristics will be classified as follows:

Tolerance Table for the Paper Attribute

<u>Sum of Demerits</u>	<u>Classification of Defect</u>
Less than 31	None
31 to 72	Major
More than 72	Critical

5. GOVERNMENT FURNISHED MATERIAL (GFM) - Defects will not be assessed for deviations from specifications which are caused by GFM if the contractor notifies the Government prior to production that the GFM is not satisfactory.

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PRINTING ATTRIBUTES

P-1. Hickies and Spots

Definition: Hickies and spots are small deformities, specks, or other imperfections on a page, cover, or spine, which result from the printing or reproduction process.

Examples: Ink spatter, hickies caused by dirty blanket, spots due to paper picking.

Instruments: 1. Visual evaluation
2. Magnifier with scale graduated in increments of .1 mm or .005 inch

Procedure: 1. Evaluate hickies, off-color spots, and ink spots in accordance with the following table:

<u>Diameter</u>	<u>Count</u>
less than 1 mm (.04 in.)	1
1 to but not including 2 mm (.08 in.)	3
2 through 3 mm (.12 in.)	15
greater than 3 mm (.12 in.)	45

DEMERIT TABLE FOR HICKIES AND/OR SPOTS

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	5 to and including 14 counts	X		
	15 to and including 29 counts		X	
	greater than 29 counts			X
Level II	10 to and including 19 counts	X		
	20 to and including 39 counts		X	
	greater than 39 counts			X
Level III	20 to and including 29 counts	X		
	30 to and including 49 counts		X	
	greater than 49 counts			X
Level IV	30 to and including 39 counts	X		
	greater than 39 counts		X	
Level V	Not applicable to Level V			

P-2. Extraneous Marks

Definitions and Examples: Extraneous marks are undesirable marks which are not hickies or spots. Examples are lines due to plate scratches, scumming, tinting, wheel marks, oil marks, and ink bleed-through. Showthrough is not evaluated under this attribute. The two categories of deviations for extraneous marks are:

Category 1: These are marks which are readable on a densitometer and which cover an area measuring more than 1/4 inch (6.4 mm) in their smallest dimension. Examples are scumming, set off, and smearing.

Category 2: These are marks that do not fall in Category 1. Examples are roller marks, gear marks, lines due to scratches on negative or plate, and ink bleed-through.

Category 2 marks are classified according to seriousness as follows:

- a. Light Marks - Light marks are marks which are visible under standard viewing conditions and which slightly detract from the appearance of a page. Examples are visible marks measuring less than .010 square inch (6.5 square millimeters) in total area.
- b. Medium Marks - Medium marks are marks that moderately detract from the appearance of a page. Examples are visible marks measuring between .010 and .020 square inch (between 6.5 and 12.9 square millimeters) in total area.
- c. Heavy Marks - Heavy marks are marks that seriously detract from the appearance of a page. Examples are marks greater than .020 square inch (12.9 square millimeters) in total area. Marks caused by foreign matter such as oil will always be classified as heavy marks.

Instruments:

1. Visual Evaluation
2. Reflection Densitometer
3. Magnifier with scale graduated in increments of .005 inch (.1 millimeter)

Procedure:

Category 1

- a. Use a reflection densitometer with the filter giving the highest reading.
- b. Measure the three areas of greatest density in the mark. Compute the average and assign demerits on the average.

Category 2

- a. Visually inspect the marks under standard viewing conditions.
- b. Classify the marks based on the above criteria.
- c. Measure area of mark only if there is a dispute regarding the classification.

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Demerit Assessment

Assess demerits on the more detective of the two categories. A maximum of 100 demerits will be assessed per page.

DEMERIT TABLE FOR EXTRANEIOUS MARKS (CATEGORY 1)

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	Visible to but not including 0.01 density	X		
	0.01 through and including 0.02 density		X	
	greater than 0.02 density			X
Level II	0.01 to but not including 0.02 density	X		
	0.02 through and including 0.03 density		X	
	greater than 0.03 density			X
Level III	0.02 to but not including 0.03 density	X		
	0.03 through and including 0.04 density		X	
	greater than 0.04 density			X
Level IV	0.03 to but not including 0.04 density	X		
	0.04 through and including 0.05 density		X	
	greater than 0.05 density			X
Level V	Not applicable to Level V			

DEMERIT TABLE FOR EXTRANEIOUS MARKS (CATEGORY 2)

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	Light Marks		X	
	Medium Marks			X
	Heavy Marks			X
Level II	Light Marks	X		
	Medium Marks		X	
	Heavy Marks			X
Level III	Light Marks	X		
	Medium Marks		X	
	Heavy Marks			X
Level IV	Light Marks	X		
	Medium Marks	X		
	Heavy Marks		X	
Level V	Not applicable to Level V			

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P-3. Moire

- Definitions:**
1. Moire is defined as objectionable patterns which are created when halftone screens are printed over one another at incorrect screen angles. Moire may also appear when rescreening a single color halftone or screening an original halftone which contains patterned objects (e.g., fabrics).
 2. Avoidable moire is moire that is due to poor production methods rather than the inherent limitations of the process (e.g., 15 degree yellow screen angle, rescreened halftones).

- Instruments:**
1. Visual Evaluation
 2. Screen Angle Gauge

- Procedures:**
1. Visually examine halftone under standard viewing conditions.
 2. Determine the deviation of each color from the desired screen angle by means of a screen angle gauge.

DEMERIT TABLE FOR MOIRE

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	Any avoidable moire			X
Level II	Avoidable moire through and including .50 greater than .50		X	X
Level III	Avoidable moire to but not including .50 .50 through and including 1.00 greater than 1.00	X	X	X
Level IV	.50 to but not including 1.00 1.00 through and including 1.50 greater than 1.50	X	X	X
Level V	Not applicable to Level V			

P-4. Register

Definition: Register is the alinement of two or more image components. The two categories of register are:

1. Multicolor Halftone Register (Internal and/or Border)
2. Linework Register (solid colors)

- Instruments:
1. Visual Evaluation
 2. Magnifier with scale graduated in increments of .1 mm or .005 inch

Procedure:

1. Multicolor Halftone Register (Internal and/or Border)
Establish the measuring base by determining two colors in register within 0.5 row. Sum the rows of misregister for all colors. Enter the sum on the demerit table to assign demerits. If three or more colors are used and no two colors register within 1 row, assign 100 demerits to that page. If more than one illustration appears on a page, assess demerits only on the most defective illustration. A maximum of 100 demerits will be assessed per page.
2. Linework Register (Solid Colors and Specialty Screens)
Establish the measuring base by determining two colors in register within 0.10 mm. Using a magnifier with a graduated scale, measure in millimeters the misregister for each color. Sum the measurements of misregister for all colors. Enter sum on the demerit table to assign demerits. If no two colors are in register within 0.10 mm, select as the measuring base the color which will result in the smallest number of demerits.

DEMERIT TABLE FOR MULTICOLOR HALFTONE REGISTER

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	.5 to but not including 1 row	X		
	1 through and including 2 rows		X	
	greater than 2 rows			X
Level II	1 to but not including 2 rows	X		
	2 through and including 3 rows		X	
	greater than 3 rows			X
Level III	1 to but not including 2 rows	X		
	2 through and including 4 rows		X	
	greater than 4 rows			X
Level IV	Not applicable to Level IV			
Level V	Not applicable to Level V			

DEMERIT TABLE FOR SOLIDS AND LINEWORK

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	.10 mm (.004 in.) to but not including	X		
	.20 mm (.008 in.)			
	.20 mm (.008 in.) through and including		X	
	.30 mm (.012 in.)			
	greater than .30 mm (.012 in.)			X
Level II	.10 mm (.004 in.) to but not including	X		
	.20 mm (.008 in.)			
	.20 mm (.008 in.) through and including		X	
	.30 mm (.012 in.)			
	greater than .30 mm (.012 in.)			X
Level III	.20 mm (.008 in.) to but not including	X		
	.30 mm (.012 in.)			
	.30 mm (.012 in.) through and including		X	
	.40 mm (.016 in.)			
	greater than .40 mm (.016 in.)			X
Level IV	.40 mm (.016 in.) to but not including	X		
	.50 mm (.020 in.)			
	.50 mm (.020 in.) through and including		X	
	.60 mm (.024 in.)			
	greater than .60 mm (.024 in.)			X
Level V	Not applicable to Level V			

P-5. Text and Illustration Image Position

Definitions: The two categories of deviations for image position are:

1. Misplacement - Misplacement is the linear displacement of the image between the specified and actual position.
2. Skewness - Skewness is the angular displacement of the image in relation to the edges of the page.

Examples: Unintentional bleeds, incorrect placement of text, and improper alinement of two-page spreads.

Instruments:

1. Visual
2. Ruler graduated to 1/64 and .010 inches (or .1 mm)

Procedure:

1. Misplacement
By means of a ruler, determine vertical and horizontal deviations of the printed image position from the specified position. Assess demerits on the greater deviation.

2. Exceptions:

a. Image Bleeds

If either a specified image bleed does not occur or an unspecified image bleed does occur, assess 100 demerits for Levels I, II and III and 20 demerits for Level IV.

b. Facing Pages

When the vertical deviations of facing pages are in opposite directions from the specified position, sum the measurements of the two deviations. Using the demerit table for misplacement, assess demerits based on the combination of the two pages. For example, in a level III book, one margin is 3/32 inch high and the facing page margin is 2/32 inch low. Assess a total of 20 demerits to the two pages combined based on the sum of 5/32 inch.

c. Saddle Stitched Publications

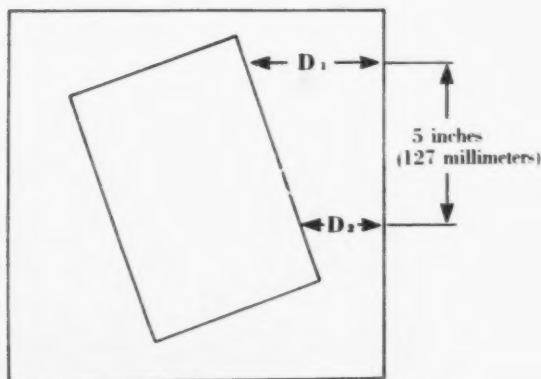
Allowances will be made for normal trade practices for margins of saddle stitched publications.

3. Skewness

Measure the distance from the printed image to the edge of the page at two points on the same edge, exactly five inches (127 millimeters) apart (see illustration). Calculate the difference in the two measurements ($D_1 - D_2$) and assess demerits based on this difference. If a five-inch (127 millimeters) distance is not available, extend the edges of the copy and the image to five inches (127 millimeters).

4. Demerit Assessment

Assess demerits for each category. A maximum of 200 demerits will be assessed per page.



1. DEMERIT TABLE FOR MISPLACEMENT

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	1/32 in. (.8 mm) to but not including 1/16 in. (1.6 mm) 1/16 in. (1.6 mm) through and including 1/8 in. (3.2 mm) greater than 1/8 in. (3.2 mm)	X	X	X
Level II	1/32 in. (.8 mm) to but not including 1/16 in. (1.6 mm) 1/16 in. (1.6 mm) through and including 1/8 in. (3.2 mm) greater than 1/8 in. (3.2 mm)	X	X	X
Level III	1/16 in. (1.6 mm) to but not including 1/8 in. (3.2 mm) 1/8 in. (3.2 mm) through and including 3/16 in. (4.8 mm) greater than 3/16 in. (4.8 mm)	X	X	X
Level IV	1/8 in. (3.2 mm) to but not including 3/16 in. (4.8 mm) 3/16 in. (4.8 mm) through and including 1/4 in. (6.4 mm) greater than 1/4 in. (6.4 mm)	X	X	X
Level V	Not applicable to Level V			

2. DEMERIT TABLE FOR SKEWNESS

Product Quality Levels	(D ₁ - D ₂ at 5" distance)	<u>Demerits</u>		
		4	20	100
Level I	.02 in. (.5 mm) to but not including .04 in. (1.0 mm) .04 in. (1.0 mm) through and including .09 in. (2.3 mm) greater than .09 in. (2.3 mm)	X	X	X
Level II	.02 in. (.5 mm) to but not including .04 in. (1.0 mm) .04 in. (1.0 mm) through and including .09 in. (2.3 mm) greater than .09 in. (2.3 mm)	X	X	X
Level III	.02 in. (.5 mm) to but not including .09 in. (2.3 mm) .09 in. (2.3 mm) through and including .18 in. (4.6 mm) greater than .18 in. (4.6 mm)	X	X	X
Level IV	.04 in. (1.0 mm) to but not including .09 in. (2.3 mm) .09 in. (2.3 mm) through and including .18 in. (4.6 mm) greater than .18 in. (4.6 mm)	X	X	X
Level V	Not applicable to Level V			

APPROXIMATE EQUIVALENT DEGREES OF SKEWNESS

Deviation D ₁ - D ₂	Degrees of Skewness
.02	1/4°
.04	1/2°
.09	1°
.13	1-1/2°
.18	2°
.26	3°

P-6. Newton's Rings

Definition: Newton's rings are irregular circles which are caused by interference (e.g., tape, dirt, etc.) with good contact or by poor contact printing technique.

Examples: Printed halftones and screen tints that have a bleached and/or mottled appearance.

Instruments: Visual

Procedure:

1. Determine the presence of Newton's rings in a single or multicolor halftone by making a visual comparison under standard viewing conditions between the original camera copy and the sample being inspected.
2. Determine the presence of Newton's rings in single color or multicolor screen tints by a visual examination of the sample under standard viewing conditions without the use of camera copy.

DEMERIT TABLE FOR NEWTON'S RINGS

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	Any visible Newton's rings			X
Level II	Any visible Newton's rings			X
Level III	Any visible Newton's rings		X	
Level IV	Any visible Newton's rings		X	
Level V	Not applicable to Level V			

P-7. Type Quality and Uniformity

Evaluation: Type will be evaluated in four ways:

1. Minimum Type Density (maximum % reflectance).
2. Variation in Type Density (% reflectance) between facing pages, within a page, or from an "OK'd press sheet."
3. Deviation in Type Dimension from the specified standard.
4. Broken characters.

Instruments:

1. Visual
2. Print Contrast Meter (% reflectance convertible to density)
3. 8x type size finder
4. 50x microscope with reticle calibrated to .001"

Procedure:

1. Minimum Type Density (maximum % reflectance).
Inspect each page visually to locate minimum type density (maximum % reflectance).
Make dry readings of the three lightest characters with a print contrast meter. Compute the average of the readings and assess demerits based on it.
2. Variation in Type Density (% reflectance) between facing pages, within a page, or from an "OK'd press sheet."
Compare measurements for each individual page inspected against a % reflectance reading for its facing page, against each other for variation within a page, or against those of an "OK'd press sheet."
3. Type Dimension
Evaluate type dimension by comparing measurements of the finished publication with the specified standard. Use the 50x microscope or print contrast meter to measure type dimensions. Tolerances are based on the maximum deviation from the specified standard.
4. Broken Characters
Count the number of broken characters on each page.
5. Demerit Assessment
Assess demerits on all of the four categories. A maximum of 400 demerits will be assessed per page.

These tolerances will also be used for the line widths and ink density of line illustrations.

Exception: Evaluation 1 "Minimum Type Density (maximum % reflectance)" and evaluation 2 "Variation in Type Density (% reflectance) between facing pages, within a page, or from an 'OK'd press sheet'" will not apply to type printed with colored ink (i.e., a type other than black). Instead, type printed with colored ink will be evaluated for visible density variation (1) between facing pages (2) within a page (3) between the page and the specified standard listed for attribute P-9 "Solids or Screen Tints Color Match." Each page containing any of these variations will be assessed 100 demerits at Levels I and II, and 20 demerits at Levels III and IV.

1. DEMERIT TABLE FOR MINIMUM TYPE DENSITY OR MAXIMUM % REFLECTANCE

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	Gloss Coated Paper			
	5% reflectance to 10%	X		
	11% reflectance to 15%		X	
	16% reflectance or greater			X
	Matte Finish, Coated Paper			
	7% reflectance to 8%	X		
	11% reflectance to 15%		X	
	16% reflectance or greater			X
Level II	Gloss Coated Paper			
	6% reflectance to 12%	X		
	13% reflectance to 17%		X	
	18% reflectance or greater			X
	Matte Finish, Coated Paper			
	8% reflectance to 12%	X		
	13% reflectance to 17%		X	
	18% reflectance or greater			X
	Uncoated Paper			
	11% reflectance to 13%	X		
	14% reflectance to 18%		X	
	19% reflectance or greater			X
Level III	Gloss Coated Paper			
	7% reflectance to 13%	X		
	14% reflectance to 18%		X	
	19% reflectance or greater			X
	Matte Finish, Coated Paper			
	9% reflectance to 13%	X		
	14% reflectance to 18%		X	
	19% reflectance or greater			X
	Uncoated Paper			
	13% reflectance to 14%	X		
	15% reflectance to 19%		X	
	20% reflectance or greater			X

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16

QUALITY ASSURANCE THROUGH ATTRIBUTES PROGRAM

Level IV	Gloss Coated Paper			
	9% reflectance to 14%	X		
	15% reflectance to 19%		X	
	20% reflectance or greater			X
	Matte Finish, Coated Paper			
	11% reflectance to 14%	X		
	15% reflectance to 19%		X	
	20% reflectance or greater			X
	Uncoated Paper			
	16% reflectance to 19%	X		
	20% reflectance to 24%		X	
	25% reflectance or greater			X
	Newsprint			
	20% reflectance to 24%	X		
	25% reflectance to 29%		X	
	30% reflectance or greater			X

Level V Not applicable to Level V

EQUIVALENT DENSITIES FOR PERCENT REFLECTANCE

Percent Reflectance	Density	Percent Reflectance	Density	Percent Reflectance	Density
2%	1.70	12%	.92	22%	.66
3%	1.52	13%	.89	23%	.64
4%	1.40	14%	.85	24%	.62
5%	1.30	15%	.82	25%	.60
6%	1.22	16%	.80	26%	.59
7%	1.15	17%	.77	27%	.57
8%	1.10	18%	.74	28%	.55
9%	1.05	19%	.72	29%	.54
10%	1.00	20%	.70	30%	.52
11%	.96	21%	.68		

2. DEMERIT TABLE FOR % REFLECTANCE VARIATION

Product Quality Levels	(Between facing pages, within a page, or from an "OK'd press sheet")	Demerits		
		4	20	100
Level I	2% to but not including 3% reflectance	X		
	3% through and including 4% reflectance		X	
	greater than 4% reflectance			X
Levels II & III	3% to but not including 4% reflectance	X		
	4% through and including 5% reflectance		X	
	greater than 5% reflectance			X
Level IV	4% to but not including 5% reflectance	X		
	5% through and including 6% reflectance		X	
	greater than 6% reflectance			X
Level V	Not applicable to Level V			

3. DEMERIT TABLE FOR TYPE DIMENSION*

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	.002 in. (.05 mm) to but not including			
	.003 in. (.08 mm)	X		
	.003 in. (.08 mm) through and including		X	
	.004 in. (.10 mm)			X
Level II	greater than .004 in. (.10 mm)			
	.002 in. (.05 mm) to but not including			
	.003 in. (.08 mm)	X		
	.003 in. (.08 mm) through and including		X	
Level III	.004 in. (.10 mm)			X
	.004 in. (.10 mm) through and including	X		
	.005 in. (.13 mm)		X	
	greater than .005 in. (.13 mm)			X
Level IV	.004 in. (.10 mm) to but not including			
	.005 in. (.13 mm)	X		
	.005 in. (.13 mm) through and including		X	
	.006 in. (.15 mm)			X
Level V	greater than .006 in. (.15 mm)			
	Not applicable to Level V			

4. DEMERIT TABLE FOR BROKEN CHARACTERS

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	1 to 2 broken characters	X		
	3 to 5 broken characters		X	
	greater than 5 characters			X
Level II	1 to 2 broken characters	X		
	3 to 5 broken characters		X	
	greater than 5 characters			X
Level III	2 to 3 broken characters	X		
	4 to 6 broken characters		X	
	greater than 6 characters			X
Level IV	6 to 8 broken characters	X		
	greater than 8 characters		X	
Level V				
	Not applicable to Level V			

*1 point equals 0.0138" (.351 mm)

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P-8. Halftone Match (single and double impression)

- Definitions:**
1. If the "OK'd press sheet" is the specified standard, the halftone match is the density deviation between the "OK'd press sheet" and the reproduction in the highlights, middletones, and shadows.
 2. When the "furnished negatives" are the specified standard, the tone reproduction curve is determined by the negative. However, the contractor is required to meet the minimum solid ink density and to maintain dot structure and two page spread requirements, allowing for normal dot gain from the "furnished negatives."
 3. When the "camera copy" is the specified standard, the solid ink density, dot structure, and two-page spread requirements shall apply to halftone match. Because proofs such as dyluxes and veloxes do not truly reflect the quality of the finished product, their "OK" by the ordering agency does not relieve the contractor from meeting these tolerances.

- Instruments:**
1. Visual Evaluation
 2. Reflection densitometer
 3. Magnifier

- Procedure:**
1. All specified standards.
 - a. Assess 20 demerits if highlight or shadow dot structure is not maintained in the reproduction and 100 demerits if detail is lost. However, normal dropout of extreme highlights is acceptable.

Assess 20 demerits for excessive compression of highlights or shadows (e.g., midtone shifts).
 - b. If a visible density shift occurs in a single illustration that occupies a two-page spread, for each page assess 100 demerits at Levels I and II, and 20 demerits at Levels III and IV.
 - c. Make a densitometer reading in an area with solid ink density.
 - (1) For single impression halftones, use the densitometer filter that indicates the highest total density.
 - (2) For double impression black halftones, make comparative readings with the visual filter.
 - (3) For two-color duotones, make comparative densitometer readings with the two filters that indicate the highest readings.

- d. Assess demerits only on the most defective of the three areas. Assess a maximum of 100 demerits per page for single color and double black halftones and 200 demerits for two-color halftones.
2. "OK'd Press Sheet" as the Specified Standard.
 - a. Zero densitometer to the paper.
 - b. Make comparative dry measurements between the "OK'd press sheet" and the reproduction in corresponding highlight and middletone areas.

DEMERIT TABLE FOR HIGHLIGHTS

Highlight densities are measured from an area of not less than 0.15 density on the "OK'd press sheet."

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	$\pm .03$ to but not including $\pm .04$ $\pm .04$ through and including $\pm .05$ greater than $\pm .05$	X	X	X
Level II	$\pm .04$ to but not including $\pm .05$ $\pm .05$ through and including $\pm .06$ greater than $\pm .06$	X	X	X
Level III	$\pm .06$ to but not including $\pm .07$ $\pm .07$ through and including $\pm .08$ greater than $\pm .08$	X	X	X
Level IV	$\pm .07$ to but not including $\pm .08$ $\pm .08$ through and including $\pm .09$ greater than $\pm .09$	X	X	X
Level V	Not applicable to Level V			

DEMERIT TABLE FOR MIDDLETONES

Middletone densities are measured from an area between 0.45 to 0.60 on "OK'd press sheet."

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	$\pm .10$ to but not including $\pm .11$ $\pm .11$ through and including $\pm .12$ greater than $\pm .12$	X	X	X

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Level II	$\pm .11$ to but not including $\pm .12$ $\pm .12$ through and including $\pm .13$ greater than $\pm .13$	X	X	X
Level III	$\pm .12$ to but not including $\pm .15$ $\pm .15$ through and including $\pm .20$ greater than $\pm .20$	X	X	X
Level IV	$\pm .15$ to but not including $\pm .20$ $\pm .20$ through and including $\pm .25$ greater than $\pm .25$	X	X	X
Level V	Not applicable to Level V			

DEMERIT TABLE FOR SHADOWS

Tolerances in the shadow areas are based on the following solid ink densities:

single impression black halftones

coated stock	1.40
uncoated stock	1.10

double impression black halftones

coated stock	1.70
uncoated stock	1.30

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	$-.02$ to but not including $-.06$ $-.06$ through and including $-.12$ greater than $-.12$	X	X	X
Level II	$-.02$ to but not including $-.08$ $-.08$ through and including $-.16$ greater than $-.16$	X	X	X
Level III	$-.02$ to but not including $-.10$ $-.10$ through and including $-.20$ greater than $-.20$	X	X	X
Level IV	$-.02$ to but not including $-.10$ $-.10$ through and including $-.25$ greater than $-.25$	X	X	X
Level V	Not applicable to Level V			

P-9. Solid or Screen Tints Color Match

Definition: Solid or screen tints color match is the density deviation between the reproduction and the specified standard. There are three solid and/or screen tint categories:

1. Single Color Solids or Tints
2. Multicolor Solids or Tints
3. Process Color Solids or Tints

Instruments:

1. Visual Evaluation
2. Reflection Densitometer

Procedure:

1. For single color solids or tints, make a dry comparative densitometer reading using the filter that will indicate the highest density.
2. For multicolor solids or tints, make a dry comparative densitometer reading using the filter that will indicate the highest density.
3. For process color solids or tints, use the scoring system for Process Color Halftones (P-10) to determine demerits.

Exceptions: If a visible density shift occurs within or between, solids or tints (on a single page or on a two-page spread), 100 demerits at Levels I and II, and 20 demerits at Levels III and IV will be assessed for each page.

DEMERIT TABLE FOR SOLIDS AND/OR SCREEN TINTS

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	+ .05 to but not including + .10 density	X		
	+ .10 through and including + .15 density		X	
	greater than + .15 density			X
	Visible variation within a solid			X
Level II	+ .07 to but not including + .12 density	X		
	+ .12 through and including + .17 density		X	
	greater than + .17 density			X
	Visible variation within a solid			X
Level III	+ .09 to but not including + .14 density	X		
	+ .14 through and including + .19 density		X	
	greater than + .19 density			X
	Visible variation within a solid		X	
Level IV	+ .12 to but not including + .17 density	X		
	+ .17 through and including + .22 density		X	
	greater than + .22 density			X
	Visible variation within a solid		X	
Level V	Not applicable to Level V			

P-10 Process Color Match

- Definitions:
1. Process color match is the fidelity of color match between the item being inspected and the specified standard.
 2. A perceptible shift is a shift in color between the specified standard and the sample, that is perceptible under standard viewing conditions but is not large enough to be classified as objectionable.
 3. An objectionable shift is a shift between the specified standard and the sample causing a definite change of color. Examples are fleshtones shifting slightly towards a yellow or magenta hue, green grass taking on a yellow or cyan cast, browns turning slightly reddish or yellowish, and overall density change.
 4. A serious shift is a shift between the specified standard and the sample causing a change of color approaching misrepresentation or loss of identity. Examples are fleshtones, browns, and grays turning green or purple, green grass turning brown or magenta, and plugged shadows or washed out highlights.

- Instruments:
1. Visual Inspection
 2. Densitometer

- Procedure:
1. Compare sample with specified standard for shifts in hue, saturation, and lightness under standard viewing conditions (see paragraph 1-11, "Standard Viewing Conditions").
 2. Assess demerits in accordance with the table below (maximum 100 demerits per page).
 3. When a sample of production run press sheets (fan) is required:
 - a. Assess demerits to each page.
 - b. Combine corresponding sample numbers from all fans to construct a set of "equivalent books".
 - c. Calculate an ADL for each equivalent book.

DEMERIT TABLE FOR PROCESS COLOR MATCH

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Level I	Perceptible shift		X	
	Objectionable shift			X
	Serious shift: (See finishing attribute F-18)			

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Level II	Perceptible shift	X	
	Objectionable shift		X
	Serious shift		X
Level III	Objectionable shift	X	
	Serious shift		X
Level IV	Not applicable to Level IV		
Level V	Not applicable to Level V		

P-11. Rub-Resistance of Printed Image

Definition: Rub-resistance is the resistance of the printed image to smearing onto similar stock when rubbed with that stock. There are two categories of rub-resistance:

1. Rub-Resistance of Unvarnished Image
2. Rub-Resistance of Varnished Image

Instruments:

1. Visual Evaluation
2. Reflection Densitometer
3. Rub Tester (Sutherland or equivalent)

Procedure:

1. Unvarnished Image
 - a. Calibrate the densitometer to the blank strip of stock.
 - b. Test a representative sample of the printed product on the Rub Tester. Give a 3" x 6" (76.2 mm x 152.4 mm) printed sample 25 rubs at a pressure of 1.0 P.S.I. against a 2" x 5-1/4" (50.8 mm x 133.4 mm) blank strip of stock similar to that on which the sample is printed.
 - c. Make three density readings in the area of highest density on the blank 2" x 5-1/4" (50.8 mm x 133.4 mm) test strip. Use the densitometer filter which indicates the maximum density for the color of ink used in the printed sample.
 - d. Calculate an average density for the rub-off smear based on the three independent density readings.
 - e. Perform all tests at least 72 hours after the printing operation.
2. Varnished Image

Follow the same procedure as above with the exception that each sample will be given 50 rubs at a pressure of 1.0 P.S.I. (.70308 gm/mm²).

1. DEMERIT TABLE FOR RUB-RESISTANCE OF UNVARNISHED IMAGE

Product Quality Levels		<u>Demerits</u>		
		4	20	100
All Levels	<u>Type</u>			
	.04 through and not including .05 density	X		
	.05 through and including .06 density		X	
	greater than .06 density			X
All Levels	<u>Halftones</u>			
	.05 through and not including .06 density	X		
	.06 through and including .07 density		X	
	greater than .07 density			X
All Levels	<u>Solids</u>			
	.06 through and not including .07 density	X		
	.07 through and including .08 density		X	
	greater than .08 density			X

2. DEMERIT TABLE FOR RUB-RESISTANCE OF VARNISHED IMAGE

Product Quality Levels		<u>Demerits</u>		
		4	20	100
Levels I	.12 to but not including .14 density	X		
	.14 through and including .16 density		X	
	greater than .16 density			X
Levels II	.12 to but not including .14 density	X		
	.14 through and including .16 density		X	
	greater than .16 density			X
Levels III	.12 to but not including .14 density	X		
	.14 through and including .16 density		X	
	greater than .16 density			X
Level IV	Not applicable to Level IV			
Level V	Not applicable to Level V			

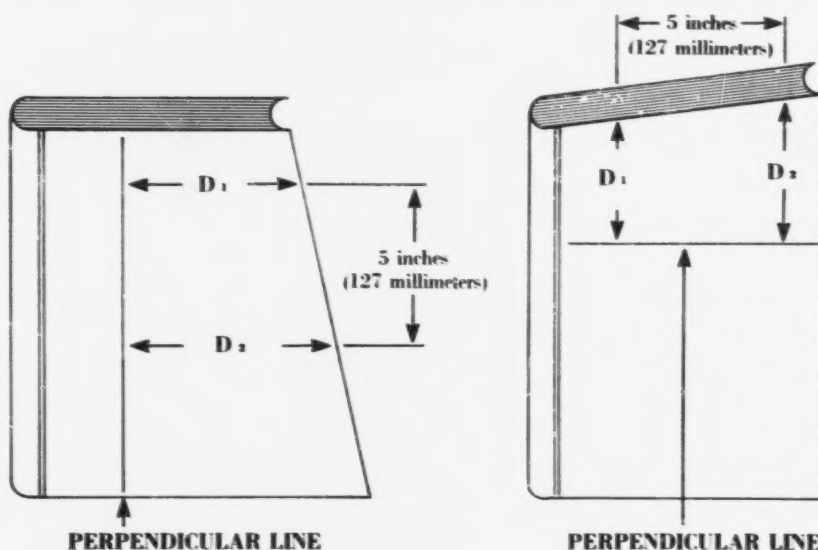
FINISHING ATTRIBUTES

F-1. Trim Size

- Definitions:
1. Nonspecified trim size is any deviation in the specified horizontal or vertical trim size.
 2. Nonflush trim is any variation in length or width within a copy.
 3. Unsquare trim is defined as the angular misalignment of the trimmed edges of a copy.

- Instruments:
1. Visual Evaluation
 2. Ruler graduated in 1/64 and .020 inches or .1 mm.

- Procedure:
1. Nonspecified Trim Size
Determine the largest deviations of the horizontal and vertical trim from the specified size. Classify the defect based on these deviations.
 2. Nonflush Trim
Determine the greatest deviations in length and width between two pages in the copy. Classify the defect based on the greater deviation.
 3. Unsquare Trim
 - a. Draw a line perpendicular to the edge where the maximum angular misalignment occurs (see diagrams).
 - b. Measure distances D_1 and D_2 from this line to the edge that should be parallel to it.
 - c. Classify the defect based on the value of $D_1 - D_2$.



4. Limitation
Classify a single defect based on the most defective of the three categories.

1 & 2. TOLERANCE TABLE FOR TRIM SIZE AND/OR NONFLUSH TRIM

Product Quality Levels		<u>Classification of Defect</u>
		Major
Level I	greater than 1/16 in. (1.6 mm)	X
Level II	greater than 3/32 in. (2.4 mm)	X
Level III	greater than 1/8 in. (3.2 mm)	X
Level IV	greater than 3/16 in. (4.8 mm)	X
Level V	greater than 1/4 in. (6.4 mm)	X

3. TOLERANCE TABLE FOR UNSQUARE TRIM

Product Quality Levels	(D ₁ - D ₂ at 5" distance)	<u>Classification of Defect</u>
		Major
Level I	greater than .04 in. (1.0 mm)	X
Level II	greater than .04 in. (1.0 mm)	X
Level III	greater than .09 in. (2.3 mm)	X
Level IV	greater than .09 in. (2.3 mm)	X
Level V	greater than .13 in. (3.3 mm)	X

APPROXIMATE EQUIVALENT DEGREES OF SKEWNESS

Deviation D ₁ - D ₂	Degrees of Skewness
.02	1/4°
.04	1/2°
.09	1°
.13	1-1/2°
.18	2°
.26	3°

F-2. Misplacement and Misalignment of Cover Image

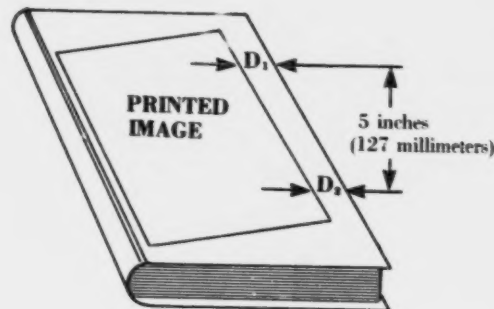
- Definitions:
1. Misplacement is the difference between the specified and actual location of a printed image on a cover.
 2. Misalignment is the angular displacement from specifications of a printed image on a cover.

- Instruments:
1. Visual Evaluation
 2. Ruler graduated in 1/64 and .020 inches or .1 mm.

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Procedure:

1. Misplacement
Measure both vertical and horizontal margins for conformance to specified dimensions. Classify the defect based on the greatest deviation.
2. Misalignment
Measure the distance from the printed image to the edge of the cover at two points on the same edge exactly five inches (127 mm) apart (see illustration). If a 5-inch (127 mm) distance is not available on the copy being inspected, extend the image and edge of the cover on a blank sheet. Calculate the difference between the two measurements ($D_1 - D_2$). Classify the defect based on this difference.
3. Limitation
Classify a single defect based on the more defective of the two categories.

1. TOLERANCE TABLE FOR MISPLACEMENT OF COVER IMAGE

Product Quality Levels	<u>Classification of Defect</u>	
	Major	
Level I	greater than 1/16 in. (1.6 mm)	X
Level II	greater than 1/16 in. (1.6 mm)	X
Level III	greater than 3/32 in. (2.4 mm)	X
Level IV	greater than 1/8 in. (3.2 mm)	X
Level V	greater than 3/16 in. (4.8 mm)	X

2. TOLERANCE TABLE FOR MISALINEMENT OF COVER IMAGE

Product Quality Level	(D ₁ - D ₂ at 5" distance)	<u>Classification of Defect</u>
		Major
Level I	greater than .04 in. (1.0 mm)	X
Level II	greater than .04 in. (1.0 mm)	X
Level III	greater than .09 in. (2.3 mm)	X
Level IV	greater than .18 in. (4.6 mm)	X
Level V	greater than .18 in. (4.6 mm)	X

APPROXIMATE EQUIVALENT DEGREES OF SKEWNESS

<u>Deviation D₁ - D₂</u>	<u>Degrees of Skewness</u>
.02	1/4°
.04	1/2°
.09	1°
.13	1-1/2°
.18	2°
.26	3°

F-3. Cover Position

- Definitions:
1. Cover position is defined as the specified distance between the position of the text and endleaves in relation to the cover.
 2. Text flush with cover is defined as a misalignment or misplacement of the text in relation to the cover to such a degree that the text and/or endleaves extend to the edge of the cover.
 3. Cover and text overlap is defined as a misalignment or misplacement of the text in relation to the cover to such a degree that the text and/or endleaves extend beyond the edge of the cover.

- Instruments:
1. Visual Evaluation
 2. Ruler graduated to 1/16 inch or .1 mm.

- Procedure:
1. Measure the distance from the edge of the cover to the endleaf at the shortest point.

TOLERANCE TABLE FOR COVER POSITION

Product Quality Levels		<u>Classification of Defect</u>	
		Major	Critical
Levels I - V	Less than or equal to 1/16 in. (1.6 mm) to the point where the text and/or endleaf is flush with the cover. Any cover and text overlap.	X	X

F-4. Folding Position and Skewness (Folded Forms and Brochures)

- Definitions:
1. A deviation in folding position is the difference between the specified and actual position of a fold.
 2. Folding skewness is the angular displacement of a fold from the specified position.

- Instruments:
1. Ruler graduated in 1/64 and .020 inches or .1 mm.
 2. Visual Evaluation

- Procedure:
1. Deviations in Folding Position
Measure the maximum deviation of the fold from the specified position.
 2. Folding Skewness
Measure the distance from the fold to the specified fold line at two points exactly 5 inches (127 mm) apart. If a 5-inch (127 mm) distance is not available, extend the two lines on a blank sheet. Calculate the difference in the two measurements and classify the defect on this value.
 3. Limitation
Classify only one defect based on the more defective of the two categories.

1. TOLERANCE TABLE FOR DEVIATION IN FOLDING POSITION

Product Quality Levels		<u>Classification of Defect</u>	
		Major	
Level I	greater than 1/16 in. (1.6 mm)	X	
Level II	greater than 1/16 in. (1.6 mm)	X	
Level III	greater than 1/16 in. (1.6 mm)	X	
Level IV	greater than 3/32 in. (2.4 mm)	X	
Level V	greater than 3/32 in. (2.4 mm)	X	

QUALITY ASSURANCE THROUGH ATTRIBUTES PROGRAM

2. TOLERANCE TABLE FOR FOLDING SKEWNESS

Product Quality Levels	(D ₁ - D ₂ at 5" distance)	<u>Classification of Defect</u>
		Major
Level I	greater than .18 in. (4.6 mm)	X
Level II	greater than .18 in. (4.6 mm)	X
Level III	greater than .18 in. (4.6 mm)	X
Level IV	greater than .26 in. (6.6 mm)	X
Level V	greater than .26 in. (6.6 mm)	X

APPROXIMATE EQUIVALENT DEGREES OF SKEWNESS

<u>Deviation D₁ - D₂</u>	<u>Degrees of Skewness</u>
.02	1/40
.04	1/20
.09	10
.13	1-1/20
.18	20
.26	30

F-5. Perfect-Bound Book Durability

Definition: Perfect-bound book durability is defined as the durability of the adhesive binding under tests that simulate normal usage of the book during its expected useful life. Four tests will be used:*

1. Subway Test
2. Page Pull Test
3. Page Flex Test
4. Adhesive Temperature Stability Test

Instruments:

1. Page Pull Tester
2. Flex Tester
3. Scale
4. Oven
5. Refrigerator

Procedure: 1. Subway Test
Open the book completely and bring the covers back to back. Perform this test in a minimum of three places: 1/4, 1/2, and 3/4 of the way through the book. Perform the test at 75°F. ± 10° F. (23.9° C. ± 5.6° C.).

*An individual book should not be used in more than one of the tests.

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2. Page Pull Test

Test pages for the pounds of pull per inch of backbone required to separate the page from the adhesive line. Perform this test in a minimum of three places: 1/4, 1/2, and 3/4 of the way through the book. The defect is classified based on the lowest pull value of the pages tested. Perform the test at 75°F. $\pm$ 10° F. (23.9° C. $\pm$ 5.6° C.).

3. Page Flex Test

Flex a page with 2.5 pounds (1,134 gm) of pull until the page separates from the adhesive line or reaches 126 flexes. Perform this test in a minimum of three places: 1/4, 1/2, and 3/4 of the way through the book. Record the exact page numbers chosen for the test. If a test page separates from the adhesive line, retest that area of the book by moving 10 pages (5 leaves) in either direction from the original location of the defective page. Two failures are required in a book before a defect is classified and the test may be terminated when two pages fail. The defect is classified by using the lowest number of flexes for any of the selected locations in the book. Perform the test at 75° F. $\pm$ 10° F. (23.9° C $\pm$ 5.6° C). Note: Failure of individual pages in tests 2 and 3 at a point other than the adhesive line will not be classified as a defect in the perfect binding.

4. Adhesive Temperature Stability Test

Test the book per 1, 2, or 3 after it has undergone the following treatment:

- a. Condition book at 130° F. $\pm$ 5° F. (54.4° C. $\pm$ 2.8° C.) for 72 hours.
- b. Condition book at 22° F. $\pm$ 5° F. (-5.6° C. $\pm$ 2.8° C.) for 72 hours.
- c. Condition book at 75° F. $\pm$ 10° F. (23.9° C. $\pm$ 5.6° C.) for 6 hours.

5. Limitation

Only the most serious defect resulting from the tests above will be classified. For example, if a page pull is a major defect and page flex is a critical defect, the book would be assessed a single critical defect.

TOLERANCE TABLE FOR PERFECT-BOUND BOOK DURABILITY

Product Quality Levels		<u>Classification of Defect</u>	
		Major	Critical
1. <u>SUBWAY TEST</u>			
All levels	Any loosening of pages at any location.		X
2. <u>PAGE PULL TEST</u>			
All levels	2.0 lbs per inch (35.7g/mm) of backbone to and including 1.5 lbs per inch (26.8g/mm) of backbone.	X	
	Less than 1.5 lbs per inch (26.8g/mm) of backbone.		X
3. <u>PAGE FLEX TEST</u>			
All levels	125 to and including 75 flexes.	X	
	Less than 75 flexes.		X

F-6. Loose Cover, Pages, and Binding

Definition: Loose covers are defined as covers which are inadequately attached to the text. The three categories are:

1. Case-bound Cover
2. Glued Cover
3. Sewn or Stitched Cover

Instruments: 1. Visual Evaluation

- Procedure:
1. Case-bound Cover
Inspect endsheets for wrinkles, bubbles, tears, looseness, tears in the gutter, and improper adherence of endsheets to cover. Inspect cover for looseness of binding materials such as headbands, backing, and crash.
 2. Glued Cover
Inspect the cover and text to determine that they adhere to the spine at all points.
 3. Sewn or Stitched Cover
Inspect for any looseness of the cover or text due to any improper stitching, sewing, and/or any signature starts.

TOLERANCE TABLE FOR LOOSE COVER OR BINDING

Product Quality Levels		<u>Classification of Defect</u>	
		Major	Critical
All levels	1. <u>Case-bound</u> Wrinkles or bubbles in endsheets, endsheets loose or torn around the edges (with the cover securely fastened), or any looseness of bind- ing materials.	X	
	Endsheets not glued securely all the way to the joint, or endsheet torn in gutter.		X
All levels	2. <u>Glued Cover</u> Any looseness of cover or text. Any separation of cover or text from book.	X	X
All levels	3. <u>Sewn and Stitched</u> Any looseness of cover or text due to stitches or threads, and/or any signa- ture starts.	X	
	Any separation of cover or text from book.		X

F-7. Excess Glue

Definition: This is defined as glue which is visible on the outside edge or the inside of the cover and/or text.

Instruments: 1. Visual Evaluation
2. Ruler

Procedure: 1. Hold the ruler perpendicular to the glue line.
2. Measure the glue line at the point of maximum spread to determine the classification.

TOLERANCE TABLE FOR GLUING

Product Quality Levels		<u>Classification of Defect</u>	
		Major	
Level I	Greater than 1/8 in. (3.2 mm)	X	
Level II	Greater than 1/8 in. (3.2 mm)	X	
Level III	Greater than 3/16 in. (4.8 mm)	X	
Level IV	Greater than 1/4 in. (6.4 mm)	X	
Level V	Greater than 1/4 in. (6.4 mm)	X	

F-8. Damaged Pages

Definition: Damaged pages consist of the following categories:

1. Wrinkles radiating from the fold of a book
2. Dog-ears and wrinkles greater than 1/8 of an inch (3.2 mm) in width
3. Connected or torn pages

Instruments: 1. Visual

Procedure: 1. Calculate the percentage of damaged pages in relation to the number of pages in the book.
2. Classify a single defect based on the most defective of the three categories.

TOLERANCE TABLE FOR DAMAGED PAGES
1. WRINKLES RADIATING FROM THE FOLD OF A BOOK

Product Quality Levels		<u>Classification of Defect</u>
		Major
Level I	Greater than 5%	X
Level II	Greater than 8%	X
Level III	Greater than 12%	X
Level IV	Greater than 15%	X
Level V	Greater than 25%	X

TOLERANCE TABLE FOR DAMAGED PAGES
2. DOG-EARS AND WRINKLES GREATER
THAN 1/8 OF AN INCH (3.2 MM)

Product Quality Levels		<u>Classification of Defect</u>
		Major
Level I	A single dog-ear or wrinkle	X
Level II	Greater than 2%	X
Level III	Greater than 3%	X
Level IV	Greater than 5%	X
Level V	Greater than 7%	X

TOLERANCE TABLE FOR DAMAGED PAGES
3. CONNECTED OR TORN PAGES

Product Quality Levels		<u>Classification of Defect</u>	
		Major	
Level I	A single connected or torn page	X	
Level II	Greater than 2%	X	
Level III	Greater than 5%	X	
Level IV	Greater than 7%	X	
Level V	Greater than 10%	X	

F-9 Damaged Edges

Examples: Examples of damaged edges are untrimmed signatures and edges which are feathered, ragged, or burred.

Instruments: 1. Visual Evaluation
 2. Clear Plastic Grid consisting of 1/4 in (6.35 mm) squares.

Procedure: 1. Measure damaged edges by placing the clear plastic grid over the entire edge where the damage is located.
 2. Count the number of squares which cover the damage.
 3. Calculate the percentage of squares containing the damage in relation to the number of squares within the entire edge.
 4. Classify the defect based on the edge of the copy that contains the most damage.

TOLERANCE TABLE FOR DAMAGED EDGES

Product Quality Levels		<u>Classification of Defect</u>	
		Major	Critical
Level I	Any visible burred, feathered, or ragged edges.	X	
	Any untrimmed signatures		X
Level II	Greater than 5% burred, feathered, or ragged edges.	X	
	Any untrimmed signatures	X	
Level III	Greater than 10% burred, feathered, or ragged edges.	X	
	Any untrimmed signatures	X	

Level IV	Greater than 15% burred, feathered, or ragged edges.	X
	Any untrimmed signatures	X
Level V	Greater than 25% burred, feathered, or ragged edges.	X
	Any untrimmed signatures	X

F-10. Warpage of Case-bound Books (Cover and Text)

Definition: This is defined as a deviation of any page or cover from the horizontal plane formed by a copy when lying on a flat surface.

Instruments: 1. Visual Evaluation
2. Ruler graduated in 1/64 and .020 in. (.1 mm).

Procedure: Place the copy on a flat surface. Measure the maximum deviation perpendicular to the flat surface.



COVER POINT of MAXIMUM VERTICAL DEVIATION



TOLERANCE TABLE FOR WARPAGE OF CASE-BOUND BOOKS

Product Quality Levels		Classification of Defect
		Major
Level I	Greater than .03 in. (.8 mm)	X
Level II	Greater than .03 in. (.8 mm)	X
Level III	Greater than .04 in. (1.0 mm)	X
Level IV	Greater than .10 in. (2.5 mm)	X
Level V	Greater than .12 in. (3.0 mm)	X

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F-11. Damaged Covers

Definition: Damaged covers consist of the following categories:

1. Wrinkles - Wrinkles are ridges, furrows, or creases formed on the smooth surface of the spine or cover. Exception: Wrinkles in the spine of perfect-bound books are classified under a separate tolerance table.
2. Bubbles - Bubbles are liftings of the paper or cloth covering on the surface of the cover or spine.
3. Cuts - Cuts are breaches in a cover which expose papers or cloth fibers.
4. Scratches - Scratches are blemishes which are visible under standard viewing conditions and which do not expose any paper or cloth fibers.

Instruments:

1. Visual Evaluation
2. Clear Plastic Grid consisting of 1/4 in. (6.35 mm) squares.

Procedure:

1. Measure damaged covers by placing the clear plastic grid over the entire surface of the book where the damage is located.
2. Count the squares which cover the damage.
3. Calculate the percentage of squares that cover the damage in relation to the number of squares in the entire area.
4. Classify the defect based on the edge of the copy that contains the maximum amount of damage.

TOLERANCE TABLE FOR DAMAGED COVERS*

Product Quality Levels		<u>Classification of Defect</u>	
		Major	Critical
Level I	Any visible wrinkles, bubbles, or scratches. Any cuts	X	X
Level II	Any visible wrinkles, bubbles, or scratches. Any cuts	X	X
Level III	Greater than 10% wrinkles, bubbles, or scratches. Any cuts	X X	
Level IV	Greater than 20% wrinkles, bubbles, or scratches. Any cuts	X X	
Level V	Any cuts	X	

*Note: See following table regarding wrinkles in spine of perfect-bound books.

QUALITY ASSURANCE THROUGH ATTRIBUTES PROGRAM

TOLERANCE TABLE FOR DAMAGED COVERS
 (WRINKLES ON SPINE OF PERFECT-BOUND BOOKS)

Product Quality Levels		<u>Classification of Defect</u>	
		Major	
Level I	Any visible wrinkles (standard viewing conditions)	X	
Level II	Greater than 10%	X	
Level III	Greater than 20%	X	
Level IV	Greater than 30%	X	
Level V	Greater than 30%	X	

TOLERANCE TABLES FOR MISCELLANEOUS FINISHING ATTRIBUTES

			<u>Classifications of Defects</u>	
			Major	Critical
F-12.	Missing Pages	All Five PQL's		X
F-13.	Upside Down Cover	All Five PQL's		X
F-14.	Upside Down Pages	All Five PQL's		X
F-15.	Blank Pages-Other Than Specified	All Five PQL's		X
F-16.	Wrong Pagination	All Five PQL's		X
F-17.	Loss of Information - Loss of information is defined as any omission of or damage to the printed image which impairs the transmission of the intended information. All Five PQL's			X
F-18.	A Serious Shift in Process Color Match as defined in Printing Attribute P-10, Process Color Match. Only PQL I		X	

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PAPER ATTRIBUTE

Paper Characteristics

1. Acidity (pH Value):

a. "Precision Requirements" all stocks when so designated.

Deficiency: Demerit Table

Less than 0.3 pH unit----- 4

0.3-0.5 pH unit----- 12

More than 0.5 pH unit----- 36

Example: Spec (5.0)-0.3=4.7; Over 4.7 pH but less than 5.0=4 demerits

b. "Regular Requirements" all stock when so designated or if no designation in solicitation.

Deficiency: Demerit Table

Less than 0.36 pH unit----- 4

0.36 - 0.6 pH unit----- 12

More than 0.6 pH unit----- 36

2. Alpha Cellulose:

Deficiency: Demerit Table

Less than 5 percentage points----- 4

5-10 percentage points----- 12

More than 10 percentage points----- 36

3. Basis Weight:

Deficiency: Demerit Table

Not as specified----- 36

4. Bursting Strength:

Deficiency: Demerit Table

Less than 10 pct----- 4

10-25 pct----- 12

More than 25 pct----- 36

Example: Spec (30) x 25 pct=7.5; 30-7.5=22.5; Less than 22.5

Bursting Strength=36 demerits.

5. Copper Number (excess copper number):

Deficiency: Demerit Table

Less than 25 pct----- 4

25-50 pct----- 12

More than 50 pct----- 36

6. Dirt--Same as 4 above.

7. Finish (Smoothness):

a. "Precision Requirements" all stocks when so designated.

Deficiency: Demerit Table

Less than 5 pct----- 4

5-10 pct----- 12

More than 10 pct----- 36

b. "Regular Requirements" all stock when so designated or if no designation in solicitation.

Deficiency: Same as 4 above.

Example: Spec (50-125)x25 pct; 50x25 pct=12.5; 125x25 pct=31.25;

50-12.5=37.5; 125+31.25=156.25. Less than 37.5 or more than

156.25=36 demerits.

8. Folding Endurance--Same as 4 above.

9. Gloss--Same as 4 above.

10. Oil Penetration--Same as 5 above.

11. Opacity:

Deficiency:	Demerit Table
Less than 1.0 percentage point-----	4
1.0-2.0 percentage points-----	12
More than 2.0 percentage points or-----	36
Individual specimen averaging more than 0.5 percentage point below minimum stated in specification.	

12. Optical Brighteners:

a. "Precision Requirements" all stocks when so designated.

Deficiency:	Demerit Table
Less than 0.5 percentage point-----	4
0.5-1.0 percentage point-----	12
More than 1 percentage point-----	36
Example: Spec (2 pct)+1=3 pct; Over 3 pct Optical Brighteners=36 demerits.	

b. "Regular Requirements" all stock when so designated or if no designation in solicitation.

Deficiency:	Demerit Table
Less than 2 percentage points-----	4
2-4 percentage points-----	12
More than 4 percentage points-----	36

13. Pick Resistance (Wax Pick):

Deficiency:	Demerit Table
Less than 1 below No. specified.-----	4
1.0-2.0 below No. specified-----	12
More than 2.0 below No. specified or----	36
Individual specimen averaging more than 1 No. below minimum stated in specification.	

.4. Porosity--Same as 4 above.

.5. Rosin (Excess)--Same as 4 above.

.6. Stiffness--Same as 4 above.

.7. Stock (Fiber Analysis):

a. Papers required to contain 25 pct, 50 pct, 100 pct cotton/linen fibers or 100 pct of specified fiber, other than cotton/linen.

Deficiency in specified fiber:	Demerit Table
Less than 3 percentage points-----	4
3-5 percentage points-----	12
More than 5 percentage points-----	36
Example: Spec (100 pct)-3=97 pct; Over 97 pct up to 100 pct cotton/linen fibers=4 demerits.	

Presence of unbleached or groundwood (other than Kraft):

	Demerit Table
Less than 3 percentage points-----	4
3-5 percentage points-----	12
More than 5 percentage points-----	36
Example: Spec (100 pct)-3=97 pct; Over 97 pct up to 100 pct cotton/linen fibers=two related characteristics or 6 demerits; and Spec (100 pct)-3 pct unbleached or groundwood=97 pct; Over 97 pct up to 100 pct cotton/linen fibers=4 demerits.	

b. Other papers required to be free from unbleached or groundwood.

Presence of unbleached or groundwood:

	Demerit Table
Less than 3 percentage points-----	4
3-5 percentage points-----	12
More than 5 percentage points-----	36

- c. Papers required to have not more than specified percentages of unbleached groundwood or specified principal fiber content.
Excess of unbleached or groundwood or deficiency in specified fiber content:

Demerit Table

Less than 5 percentage points-----	4
5-10 percentage points-----	12
More than 10 percentage points-----	36

18. Tensile Strength--Same as 4 above.

19. Tearing Strength--Same as 4 above.

20. Thickness:

- a. Postal Card and 100 pct Cream-White Index Paper

Deficiency:

Demerit Table

Not as specified-----	36
-----------------------	----

- b. "Precision Requirements" all stocks when so designated except "a" above.

Deficiency:

Demerit Table

Less than 2 pct-----	4
2-4 pct-----	12
More than 4 pct-----	36

Example: Spec $(0.0042 + 0.0005) \times 4$ pct; 0.0042×4 pct = 0.000168; Maximum $0.0042 + 0.0005 + 0.000168 = 0.004868$; minimum $0.0042 - 0.0005 - 0.000168 = 0.003532$; Over 0.004868 or less than 0.003532 = 36 demerits.

- c. "Regular Requirements" all stock when so designated or if no designation in solicitation except "a" above.

Deficiency:

Demerit Table

Less than 4 pct-----	4
4-8 pct-----	12
More than 8 pct-----	36

- d. Variation on individual sheets from one edge to the other.

Deficiency:

Demerit Table

Less than 10 pct-----	4
10-25 pct-----	12
More than 25 pct-----	36

Example: Spec $(0.0004) \times 25$ pct; 0.0004×25 pct = 0.0001; $0.0004 + 0.0001 = 0.0005$; Variation over 0.0005 = 36 demerits.

21. Water Resistance--Same as 4 above.

22. All Other Measurable Characteristics:

Deficiency:

Demerit Table

Insignificant-----	4
Significant-----	12
Excessive-----	36

23. Judgment Characteristics:

Deficiency:

Demerit Table

Insignificant-----	4
Significant-----	12
Excessive-----	36

A GUIDE FOR EQUITABLE REDUCTIONS IN THE CONTRACT PRICE

As a guide, reductions in the contract price will be based on the defects in the sample and will be calculated as follows:

- a. A discount for critical defects will be determined from the table in Appendix A.
- b. A discount for major defects will be determined from the table in Appendix B.
- c. The contract price will be reduced by the sum of the two discounts. However, the total reduction in the contract price will not exceed 25%. Appendices A & B list discounts as percentages of the contract price.

APPENDIX A

DISCOUNT TABLE FOR CRITICAL DEFECTS

Number of critical defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315
1	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	--	--	--	--	--
2	20.0	12.9	7.1	5.0	5.0	5.0	5.0	5.0%	--	--	--	--
3	25	25	21.9	13.2	7.5	5.0	5.0	5.0	5.0%	--	--	--
4	"	"	25	23.0	13.6	8.3	5.0	5.0	5.0	5.0%	--	--
5	"	"	"	25	20.2	12.6	7.4	5.0	5.0	5.0	--	--
6	"	"	"	"	25	17.2	10.2	6.0	5.0	5.0	5.0%	--
7	"	"	"	"	"	22.0	13.2	8.0	5.0	5.0	5.0	--
8	"	"	"	"	"	25	16.3	9.9	5.7	5.0	5.0	5.0%
9	"	"	"	"	"	"	19.5	12.0	7.0	5.0	5.0	5.0
10	"	"	"	"	"	"	22.8	14.1	8.3	5.0	5.0	5.0
11	"	"	"	"	"	"	25	16.2	9.6	5.6	5.0	5.0
12	"	"	"	"	"	"	"	18.4	10.9	6.5	5.0	5.0
13	"	"	"	"	"	"	"	20.5	12.3	7.4	5.0	5.0
14	"	"	"	"	"	"	"	22.8	13.7	8.2	5.0	5.0
15	"	"	"	"	"	"	"	25	15.1	9.1	5.2	5.0
16	"	"	"	"	"	"	"	"	16.5	10.0	5.7	5.0
17	"	"	"	"	"	"	"	"	17.9	11.0	6.3	5.0
18	"	"	"	"	"	"	"	"	19.3	11.9	6.9	5.0
19	"	"	"	"	"	"	"	"	20.8	12.8	7.5	5.0
20	"	"	"	"	"	"	"	"	22.2	13.7	8.0	5.0
21	"	"	"	"	"	"	"	"	23.7	14.7	8.6	5.0
22	"	"	"	"	"	"	"	"	25	15.6	9.2	5.3
23	"	"	"	"	"	"	"	"	"	16.5	9.8	5.7
24	"	"	"	"	"	"	"	"	"	17.5	10.4	6.1
25	"	"	"	"	"	"	"	"	"	18.4	11.0	6.5
26	"	"	"	"	"	"	"	"	"	19.4	11.6	6.8
27	"	"	"	"	"	"	"	"	"	20.4	12.2	7.2
28	"	"	"	"	"	"	"	"	"	21.3	12.8	7.6
29	"	"	"	"	"	"	"	"	"	22.3	13.4	8.0
30	"	"	"	"	"	"	"	"	"	23.2	14.0	8.4
31	"	"	"	"	"	"	"	"	"	24.2	14.6	8.7
32	"	"	"	"	"	"	"	"	"	25	15.2	9.1
33	"	"	"	"	"	"	"	"	"	"	15.8	9.5
34	"	"	"	"	"	"	"	"	"	"	16.4	9.9

APPENDIX A

DISCOUNT TABLE FOR CRITICAL DEFECTS

Number of critical defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315
35	25	25	25	25	25	25	25	25	25	25	17.0	10.3
36	"	"	"	"	"	"	"	"	"	"	17.7	10.7
37	"	"	"	"	"	"	"	"	"	"	18.3	11.1
38	"	"	"	"	"	"	"	"	"	"	18.9	11.5
39	"	"	"	"	"	"	"	"	"	"	19.5	11.9
40	"	"	"	"	"	"	"	"	"	"	20.1	12.3
41	"	"	"	"	"	"	"	"	"	"	20.8	12.7
42	"	"	"	"	"	"	"	"	"	"	21.4	13.1
43	"	"	"	"	"	"	"	"	"	"	22.0	13.5
44	"	"	"	"	"	"	"	"	"	"	22.6	13.8
45	"	"	"	"	"	"	"	"	"	"	23.3	14.2
46	"	"	"	"	"	"	"	"	"	"	23.9	14.6
47	"	"	"	"	"	"	"	"	"	"	24.5	15.0
48	"	"	"	"	"	"	"	"	"	"	25	15.4
49	"	"	"	"	"	"	"	"	"	"	"	15.7
50	"	"	"	"	"	"	"	"	"	"	"	16.1
51	"	"	"	"	"	"	"	"	"	"	"	16.6
52	"	"	"	"	"	"	"	"	"	"	"	17.0
53	"	"	"	"	"	"	"	"	"	"	"	17.4
54	"	"	"	"	"	"	"	"	"	"	"	17.8
55	"	"	"	"	"	"	"	"	"	"	"	18.2
56	"	"	"	"	"	"	"	"	"	"	"	18.6
57	"	"	"	"	"	"	"	"	"	"	"	19.0
58	"	"	"	"	"	"	"	"	"	"	"	19.4
59	"	"	"	"	"	"	"	"	"	"	"	19.8
60	"	"	"	"	"	"	"	"	"	"	"	20.2
61	"	"	"	"	"	"	"	"	"	"	"	20.6
62	"	"	"	"	"	"	"	"	"	"	"	21.0
63	"	"	"	"	"	"	"	"	"	"	"	21.4
64	"	"	"	"	"	"	"	"	"	"	"	21.8
65	"	"	"	"	"	"	"	"	"	"	"	22.2
66	"	"	"	"	"	"	"	"	"	"	"	22.6
67	"	"	"	"	"	"	"	"	"	"	"	23.0
68	"	"	"	"	"	"	"	"	"	"	"	23.4
69	"	"	"	"	"	"	"	"	"	"	"	23.8
70	"	"	"	"	"	"	"	"	"	"	"	24.3
71	"	"	"	"	"	"	"	"	"	"	"	24.7
72	"	"	"	"	"	"	"	"	"	"	"	25

APPENDIX B

DISCOUNT TABLE FOR MAJOR DEFECTS

Number of major defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315
1	5.0%	--	--	--	--	--	--	--	--	--	--	--
2	5.0	5.0%	5.0%	5.0%	--	--	--	--	--	--	--	--
3	9.8	5.9	5.0	5.0	5.0%	--	--	--	--	--	--	--
4	17.7	11.2	5.9	5.0	5.0	5.0%	--	--	--	--	--	--
5	25	16.9	9.4	5.2	5.0	5.0	--	--	--	--	--	--
6	"	23.0	13.1	7.5	5.0	5.0	5.0%	--	--	--	--	--
7	"	25	16.9	9.9	5.4	5.0	5.0	--	--	--	--	--
8	"	"	20.9	12.4	6.9	5.0	5.0	5.0%	--	--	--	--
9	"	"	25	14.9	8.5	5.0	5.0	5.0	--	--	--	--
10	"	"	"	17.5	10.1	5.9	5.0	5.0	--	--	--	--
11	"	"	"	20.2	11.7	7.0	5.0	5.0	5.0%	--	--	--
12	"	"	"	22.9	13.4	8.0	5.0	5.0	5.0	--	--	--
13	"	"	"	25	15.0	9.1	5.0	5.0	5.0	--	--	--
14	"	"	"	"	16.7	10.2	5.7	5.0	5.0	--	--	--
15	"	"	"	"	18.5	11.4	6.4	5.0	5.0	5.0%	--	--
16	"	"	"	"	20.2	12.5	7.1	5.0	5.0	5.0	--	--
17	"	"	"	"	21.9	13.6	7.8	5.0	5.0	5.0	--	--
18	"	"	"	"	23.7	14.8	8.5	5.0	5.0	5.0	--	--
19	"	"	"	"	25	15.9	9.3	5.3	5.0	5.0	--	--
20	"	"	"	"	"	17.1	10.0	5.7	5.0	5.0	--	--
21	"	"	"	"	"	18.2	10.7	6.2	5.0	5.0	--	--
22	"	"	"	"	"	19.4	11.4	6.7	5.0	5.0	5.0%	--
23	"	"	"	"	"	20.6	12.2	7.1	5.0	5.0	5.0	--
24	"	"	"	"	"	21.8	12.9	7.6	5.0	5.0	5.0	--
25	"	"	"	"	"	23.0	13.7	8.1	5.0	5.0	5.0	--
26	"	"	"	"	"	24.2	14.4	8.6	5.0	5.0	5.0	--
27	"	"	"	"	"	25	15.2	9.0	5.0	5.0	5.0	--
28	"	"	"	"	"	"	15.9	9.5	5.2	5.0	5.0	--
29	"	"	"	"	"	"	16.7	10.0	5.6	5.0	5.0	--
30	"	"	"	"	"	"	17.4	10.5	5.9	5.0	5.0	--
31	"	"	"	"	"	"	18.2	11.0	6.2	5.0	5.0	5.0%
32	"	"	"	"	"	"	18.9	11.5	6.5	5.0	5.0	5.0
33	"	"	"	"	"	"	19.7	11.9	6.8	5.0	5.0	5.0
34	"	"	"	"	"	"	20.5	12.4	7.1	5.0	5.0	5.0
35	"	"	"	"	"	"	21.2	12.9	7.4	5.0	5.0	5.0
36	"	"	"	"	"	"	22.0	13.4	7.7	5.0	5.0	5.0
37	"	"	"	"	"	"	22.8	13.9	8.0	5.0	5.0	5.0
38	"	"	"	"	"	"	23.6	14.4	8.3	5.0	5.0	5.0
39	"	"	"	"	"	"	24.3	14.9	8.6	5.0	5.0	5.0
40	"	"	"	"	"	"	25	15.4	8.9	5.0	5.0	5.0
41	"	"	"	"	"	"	"	15.9	9.2	5.2	5.0	5.0
42	"	"	"	"	"	"	"	16.4	9.5	5.4	5.0	5.0
43	"	"	"	"	"	"	"	16.9	9.9	5.6	5.0	5.0
44	"	"	"	"	"	"	"	17.4	10.2	5.8	5.0	5.0
45	"	"	"	"	"	"	"	17.9	10.5	6.0	5.0	5.0
46	"	"	"	"	"	"	"	18.4	10.8	6.2	5.0	5.0
47	"	"	"	"	"	"	"	18.9	11.1	6.4	5.0	5.0
48	"	"	"	"	"	"	"	19.4	11.4	6.6	5.0	5.0
49	"	"	"	"	"	"	"	19.8	11.7	6.8	5.0	5.0
50	"	"	"	"	"	"	"	20.3	12.0	7.0	5.0	5.0

APPENDIX B

DISCOUNT TABLE FOR MAJOR DEFECTS

Number of major defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315
51	25	25	25	25	25	25	25	20.8	12.3	7.2	5.0	5.0
52	"	"	"	"	"	"	"	21.3	12.6	7.4	5.0	5.0
53	"	"	"	"	"	"	"	21.8	12.9	7.6	5.0	5.0
54	"	"	"	"	"	"	"	22.3	13.3	7.8	5.0	5.0
55	"	"	"	"	"	"	"	22.8	13.6	8.0	5.0	5.0
56	"	"	"	"	"	"	"	23.3	13.9	8.2	5.0	5.0
57	"	"	"	"	"	"	"	23.8	14.2	8.4	5.0	5.0
58	"	"	"	"	"	"	"	24.3	14.5	8.6	5.0	5.0
59	"	"	"	"	"	"	"	24.9	14.8	8.8	5.0	5.0
60	"	"	"	"	"	"	"	25	15.2	9.0	5.0	5.0
61	"	"	"	"	"	"	"	"	15.5	9.2	5.1	5.0
62	"	"	"	"	"	"	"	"	15.8	9.4	5.2	5.0
63	"	"	"	"	"	"	"	"	16.1	9.6	5.3	5.0
64	"	"	"	"	"	"	"	"	16.4	9.9	5.5	5.0
65	"	"	"	"	"	"	"	"	16.8	10.1	5.6	5.0
66	"	"	"	"	"	"	"	"	17.1	10.3	5.7	5.0
67	"	"	"	"	"	"	"	"	17.4	10.5	5.8	5.0
68	"	"	"	"	"	"	"	"	17.7	10.7	6.0	5.0
69	"	"	"	"	"	"	"	"	18.0	10.9	6.1	5.0
70	"	"	"	"	"	"	"	"	18.4	11.1	6.2	5.0
71	"	"	"	"	"	"	"	"	18.7	11.3	6.4	5.0
72	"	"	"	"	"	"	"	"	19.0	11.5	6.5	5.0
73	"	"	"	"	"	"	"	"	19.3	11.7	6.6	5.0
74	"	"	"	"	"	"	"	"	19.7	11.9	6.7	5.0
75	"	"	"	"	"	"	"	"	20.0	12.1	6.9	5.0
76	"	"	"	"	"	"	"	"	20.3	12.3	7.0	5.0
77	"	"	"	"	"	"	"	"	20.6	12.5	7.1	5.0
78	"	"	"	"	"	"	"	"	20.9	12.7	7.3	5.0
79	"	"	"	"	"	"	"	"	21.3	12.9	7.4	5.0
80	"	"	"	"	"	"	"	"	21.6	13.2	7.5	5.0
81	"	"	"	"	"	"	"	"	21.9	13.4	7.7	5.0
82	"	"	"	"	"	"	"	"	22.2	13.6	7.8	5.0
83	"	"	"	"	"	"	"	"	22.6	13.8	7.9	5.0
84	"	"	"	"	"	"	"	"	22.9	14.0	8.0	5.0
85	"	"	"	"	"	"	"	"	23.2	14.2	8.2	5.0
86	"	"	"	"	"	"	"	"	23.5	14.4	8.3	5.0
87	"	"	"	"	"	"	"	"	23.9	14.6	8.4	5.0
88	"	"	"	"	"	"	"	"	24.2	14.8	8.6	5.0
89	"	"	"	"	"	"	"	"	24.5	15.0	8.7	5.0
90	"	"	"	"	"	"	"	"	24.8	15.2	8.8	5.0
91	"	"	"	"	"	"	"	"	25	15.4	9.0	5.0
92	"	"	"	"	"	"	"	"	"	15.7	9.1	5.1
93	"	"	"	"	"	"	"	"	"	15.9	9.2	5.2
94	"	"	"	"	"	"	"	"	"	16.1	9.3	5.3
95	"	"	"	"	"	"	"	"	"	16.3	9.5	5.3
96	"	"	"	"	"	"	"	"	"	16.5	9.6	5.4
97	"	"	"	"	"	"	"	"	"	16.7	9.7	5.5
98	"	"	"	"	"	"	"	"	"	16.9	9.9	5.6
99	"	"	"	"	"	"	"	"	"	17.1	10.0	5.7
100	"	"	"	"	"	"	"	"	"	17.3	10.1	5.8

BEST DOCUMENT AVAILABLE

QUALITY ASSURANCE THROUGH ATTRIBUTES PROGRAM

APPENDIX B

DISCOUNT TABLE FOR MAJOR DEFECTS

Number of major defects	Number of Copies in Sample											
	2	3	5	8	13	20	32	50	80	125	200	315
101	25	25	25	25	25	25	25	25	25	17.5	10.3	5.8
102	"	"	"	"	"	"	"	"	"	17.7	10.4	5.9
103	"	"	"	"	"	"	"	"	"	18.0	10.5	6.0
104	"	"	"	"	"	"	"	"	"	18.2	10.7	6.1
105	"	"	"	"	"	"	"	"	"	18.4	10.8	6.2
106	"	"	"	"	"	"	"	"	"	18.6	10.9	6.3
107	"	"	"	"	"	"	"	"	"	18.8	11.1	6.3
108	"	"	"	"	"	"	"	"	"	19.0	11.2	6.4
109	"	"	"	"	"	"	"	"	"	19.2	11.3	6.5
110	"	"	"	"	"	"	"	"	"	19.4	11.4	6.6
120	"	"	"	"	"	"	"	"	"	21.5	12.8	7.4
130	"	"	"	"	"	"	"	"	"	23.7	14.1	8.3
140	"	"	"	"	"	"	"	"	"	25	15.4	9.1
150	"	"	"	"	"	"	"	"	"	"	16.7	10.0
160	"	"	"	"	"	"	"	"	"	"	18.1	10.8
170	"	"	"	"	"	"	"	"	"	"	19.4	11.7
180	"	"	"	"	"	"	"	"	"	"	20.8	12.5
190	"	"	"	"	"	"	"	"	"	"	22.1	13.4
200	"	"	"	"	"	"	"	"	"	"	23.4	14.2
210	"	"	"	"	"	"	"	"	"	"	24.8	15.1
220	"	"	"	"	"	"	"	"	"	"	25	15.9
230	"	"	"	"	"	"	"	"	"	"	"	16.8
240	"	"	"	"	"	"	"	"	"	"	"	17.6
250	"	"	"	"	"	"	"	"	"	"	"	18.5
260	"	"	"	"	"	"	"	"	"	"	"	19.4
270	"	"	"	"	"	"	"	"	"	"	"	20.2
280	"	"	"	"	"	"	"	"	"	"	"	21.1
290	"	"	"	"	"	"	"	"	"	"	"	21.9
300	"	"	"	"	"	"	"	"	"	"	"	22.8
310	"	"	"	"	"	"	"	"	"	"	"	23.7
320	"	"	"	"	"	"	"	"	"	"	"	24.5
330	"	"	"	"	"	"	"	"	"	"	"	25